CLAIMS

1. A method of controlling power to a high-intensity-discharge lamp comprising:

determining voltage across and current through the lamp;

approximating power to the lamp using the voltage and the current; and

regulating power to the lamp based on a comparison of the approximated power and a predetermined value.

2. The method of claim 1 wherein the current through the lamp is determined by converting the current to a representative voltage, wherein the voltage across the lamp is determined by scaling the lamp voltage.

3. The method of claim 2 wherein approximating power comprises summing the representative voltage and the scaled voltage.

4. The method of claim 1 wherein the comparison comprises determining whether the approximated power is greater or less than the predetermined value.

5. A system of controlling power to a high-intensity-discharge lamp comprising:

a voltage sensor to determine voltage across the lamp;

a current sensor to determine current through the lamp;

a control circuit operatively connected to the current sensor and voltage sensor, the control circuit approximating a lamp power based on input from the sensors, comparing the lamp power against a desired level, and regulating lamp power based on the comparison.

6. The system of claim 5 wherein the current sensor comprises a resistor connected in series with the lamp.

7. The system of claim 5 further comprising a signal conditioning circuit to scale and filter output of the current sensor.

8. The system of claim 5 wherein the voltage sensor comprises a voltage divider network shunting the lamp.

9. The system of claim 8 wherein the voltage divider includes a voltage-limiting network to reduce a starting voltage effect on the power approximation.

10. The system of claim 5 wherein the control circuit includes a summing circuit to approximate the power supplied to the lamp by adding the output from the voltage sensor and a representative voltage determined from output of the current sensor.

11. The system of claim 10 wherein the summation circuit includes a filter to average the summed voltages over time.

12. The system of claim 10 wherein the summation circuit includes a plurality of rectifiers connected to allow the absolute value of the representative voltage to be added to the absolute value of the voltage sensor output.

13 The system of claim 5 wherein the control circuit includes a voltage reference signal generator for comparing against the lamp power.

14 The system of claim 13 wherein the signal generator produces a saw tooth waveform synchronized with the sensed current and twice the frequency of the sensed current.

15 The system of claim 5 wherein the control circuit includes a current limiting component shunted by an electronic switch in series with the lamp.

16 The system of claim 10 wherein the control circuit includes a comparator circuit for comparing voltage representing lamp power to a reference.

17 The system of claim 16 wherein the comparator circuit controls an electronic switch through an electrically isolated coupler.

18 A means of controlling power to a high-intensity-discharge lamp comprising:

means for determining voltage across and current through the lamp;

means for approximating power to lamp using determined voltage and current;

means for comparing approximate power to predetermined value; and

means of regulating power to the lamp based on the power comparison.